PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patentee	: Nathan T. Hayes	
Patent No.	: 7,250,948	Examiner: Kimbinh T. Nguyen
Issued	: July 31, 2007	Group Art Unit: 2628
For	: SYSTEM AND METHOD OF VISIBLE SURFACE DETERMINATION IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS	
Docket No.	: 33072/101/101	

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE (37 CFR §1.322(a)(1)(i))

Attn: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE UNDER 37 C.F.R. 1.8
I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an enveloped addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 19 day of October, 2007.

By: M A. Ziegler
Melissa A. Ziegler

Sir:

1. Attached please find a LETTER, more particularly a request pursuant to 35 USC §254 and 37 CFR §1.322 by assignee of the subject patent to correct mistakes in a patent incurred through the fault of the Office.

2. As an alternative to expedited issuance of a Certificate of Correction as outlined in MPEP §1480.01, assignee respectfully requests, pursuant to 35 USC §254, that the Director issue a

corrected patent without charge in lieu of and with like effect as a Certificate of Correction.

3. Attached to said LETTER, in duplicate, is Form PTO/SB/44, at least one copy being suitable for printing.

4. The exact page and line number where the error(s) are shown correctly in the application file are:

   (a) Detailed in the attached LETTER, including its attachments, namely, ATTACHMENT A-F

5. Please send the Certificate/corrected patent to:

Richard C. Stempkovski, Jr.
NAWROCKI, ROONEY & SIVERTSON, P.A.
Suite 401, Broadway Place East
3433 Broadway St. N.E.
Minneapolis, MN 55413

Please charge any deficiencies or credit any over payment to Deposit Account 14-0620.

Respectfully submitted,

Nathan T. Hayes

By his attorney

Date 10/1/07

Richard C. Stempkovski, Jr.
Reg. No. 45,130
NAWROCKI, ROONEY & SIVERTSON, P.A.
Suite 401, Broadway Place East
3433 Broadway St. N.E.
Minneapolis, MN 55413
(612) 331-1464
Customer No. 05909

P A T E N T

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Patent No.	: 7,250,948	Examiner: Kimbinh T. Nguyen
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LETTER

Attn: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE UNDER 37 C.F.R. 1.8
I hereby certify that this correspondence is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an enveloped addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on this 15th day of October, 2007

By: Melissa A. Ziegler
Melissa A. Ziegler

Sir:

Pursuant to 35 USC §254 and 37 CFR §1.322(a)(1)(i), assignee of the subject U.S. patent hereby requests issuance of a Certificate of Correction to correct mistakes in a patent incurred through the fault of the Office which mistakes are clearly disclosed in the records thereof. Moreover, and specifically, assignee of the subject patent respectfully requests expedited issuance of any such Certificate of Correction as outlined in MPEP §1480.01. In the alternative, assignee respectfully requests, pursuant to 35 USC §254, that the Director issue a corrected patent without charge in lieu of and with like effect as a Certificate of Correction.

In furtherance thereof, herewith as **ATTACHMENT A**, in duplicate, is Form PTO/SB/44, with at least one copy suitable for printing. For each of the below listed requested corrections (i.e., those of Form PTO/SB/44), Applicant's documentation evidencing the changes is referenced, including the page and line numbers where the errors occur in the application file/reference, a copy of each reference cite likewise provided herewith via the indicated attachment:

In the title page: the title "SYSTEM AND METHOD VISIBLE SURFACE DETERMINATION IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS" should be replaced with --SYSTEM AND METHOD OF VISIBLE SURFACE DETERMINATION IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS-- (RESPONSE TO WRITTEN OPINION, page 2, line 6; **ATTACHMENT B**); inventor "David R. Schmidt, Brooklyn Park, MN (US)" should be deleted. (DECISION ON RENEWED REQUEST UNDER 37 CFR §1.497(D); **ATTACHMENT C**)

In the drawings, Sheet 2/19, FIG. 2, reference numeral "50" should be --51--; Sheet 7/19, FIG. 7 omits item (c) and as such should be replaced with Sheet 7/19 herewith. (PRELIMINARY AMENDMENT AND RESPONSE TO IPER AND U.S. NATIONAL PHASE, page 3, line 7 et seq.; **ATTACHMENT D**)

At col. 1, lines 27-28, the quotation ""Nobody will ever solve the antialiasing problem,"" should be replaced with --"*Nobody will ever solve the antialiasing problem,*"-- (application as filed, page 1, lines 24-25; **ATTACHMENT E**)

At col. 6, line 58, "database" should be replaced with --database 42--; at line 61, "cells 32" and "paper 30" should be replaced with --cells-- and --paper-- respectively (AMENDMENT, page 6, line 5 et seq.; **ATTACHMENT F**)

At col. 13, line 1, "system that" should be replaced with --system, that-- (PRELIMINARY AMENDMENT AND RESPONSE TO IPER AND U.S. NATIONAL PHASE, page 10, line 1; **ATTACHMENT D**); "FIG. 12" should be replaced with --FIG. 13-- (AMENDMENT, page 9, line 17; **ATTACHMENT F**)

At col. 14, line 36 "its" should be replaced with --it's-- (PRELIMINARY AMENDMENT AND RESPONSE TO IPER AND U.S. NATIONAL PHASE, page 11, line 20 et seq.; **ATTACHMENT D**)

With regard to assignee's request of the issuance of a corrected patent without charge in lieu of and with like effect as

a Certificate of Correction, said request is predicated upon issuance of the subject patent with an **erroneous listing of David R. Schmidt as inventor**. As evidenced herewith ATTACHMENT B, a DECISION ON RENEWED REQUEST UNDER 37 CFR §1.497(D) was granted in response to APPLICANT'S RENEWED PETITION UNDER 37 CRF §1.497(D) filed March 30, 2006. Moreover, in connection with said request, contrary to entered Applicant amendment of both the title of the invention and drawing sheet 7/19, more particularly FIG. 7(c) thereof, the subject patent issued without reflecting those changes (see, herewith, ATTACHMENT B & D respectively).

In light of the foregoing factual summary, assignee respectfully requests issuance of a corrected patent pursuant to 35 USC §254, and in lieu thereof, issuance of a Certificate of Correction pursuant to 37 CFR §1.322(a)(1)(i). Should the Certificate of Correction Branch have any questions or concerns about the subject request, they are encouraged to phone undersigned at the listed number.

Respectfully submitted,

Nathan T. Hayes

By his attorney,

Dated: 10/1/7

Richard C. Stempkovski, Jr.
Reg. No. 45,130
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Minneapolis, MN 55413
Telephone: (612) 331-1464
Facsimile: (612) 331-2239

ATTACHMENT A

PTO/SB/44 (04-05)
Approved for use through 04/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.
(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,250,948

APPLICATION NO.: 10/532,907

ISSUE DATE : July 31, 2007

INVENTOR(S) : Nathan T. Hayes

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the title page: at (54) title, the title "SYSTEM AND METHOD VISIBLE SURFACE DETERMINATION IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS" should be replaced with --SYSTEM AND METHOD OF VISIBLE SURFACE DETERMINATION IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS--; at (75) inventors, inventor "David R. Schmidt, Brooklyn Park, MN (US)" should be deleted.

In the drawings, Sheet 2/19, FIG. 2, reference numeral "50" should be --51--; Sheet 7/19, FIG. 7 omits item (c) and as such should be replaced with Sheet 7/19 herewith.

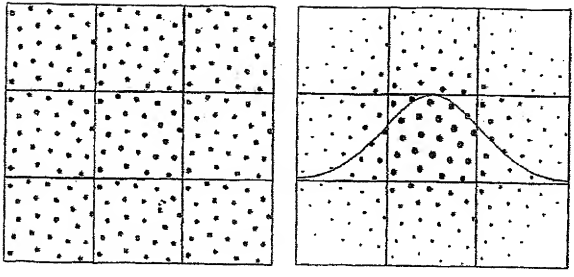
At col. 1, lines 27-28, the quotation ""Nobody will ever solve the antialiasing problem,"" should be replaced with --*"Nobody will ever solve the antialiasing problem,"*--

At col. 6, line 58, "database" should be replaced with --database 42--; at line 61, "cells 32" and "paper 30" should be replaced with --cells-- and --paper-- respectively.

At col. 13, line 1, "system that" should be replaced with --system, that--; at line 7, "FIG.12" should be replaced with --FIG. 13--.

At col. 14, line 36 "its" should be replaced with --it's--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):



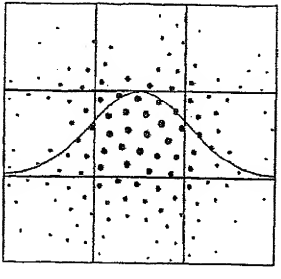


FIG. 7

PTO/SB/44 (04-05)
Approved for use through 04/30/2007. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE
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At col. 14, line 36 "its" should be replaced with --it's--.

MAILING ADDRESS OF SENDER (Please do not use customer number below):

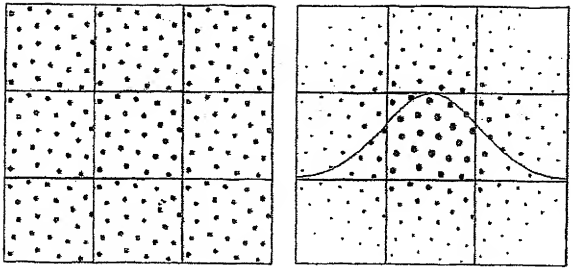

FIG. 7

ATTACHMENT B

IN THE SPECIFICATION

Please amend the specification as indicated, strikeout or double bracketed portions deleted, underlined items added, as applicable, substitute sheets reflecting the proposed changes herewith as **ATTACHMENT A:**

➢Page 1, title:

SYSTEM AND METHOD OF VISIBLE SURFACE DETERMINATION ~~SYSTEM & METHODOLOGY~~ IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS

➢Page 10, only full paragraph thereon should be replaced, so as to now read in its entirety:

With preferred embodiments of the system, an entire scene can be loaded on each computer connected to an output device and synchronously display an image either by sequentially displaying data from each computer, displaying disjoint pieces from each computer, or a combination of both. The system can casually seek edges of objects or transitional areas, i.e., areas with increased levels of information to concentrate the rendering effort. Convergence to the proper visible solution set of a pixel is a deterministic operation which exhibits quadratic convergence (i.e., $0(x^2)$. This is in contrast to point-sampling methods which are probabilistic and exhibit ~~logarithmic~~ square-root convergence (i.e., $0(x^{1/2})$.

➢Page 32, first partial paragraph thereon should be replaced, so as to now read in its entirety:

ATTACHMENT C

14 APR 2006

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Richard C. Stempkovski, Jr.
Nawrocki, Rooney & Sivertson, P.A.
Suite 401, Broadway Place East
3433 Broadway Street, N.E.
Minneapolis, MN 55413

In re Application of :
HAYES : Lynda Eberhard DECISION ON RENEWED
Application No.: 10/532,907 :
PCT No.: PCT/US03/36836 : REQUEST UNDER
Int. Filing Date: 17 November 2003 :
Priority Date: 15 November 2002 : 37 CFR 1.497(d)
Attorney Docket No.: 33072/101/101/ :
For: SYSTEM AND METHOD OF VISIBLE :
SURFACE DETERMINATION IN :
COMPUTER GRAPHICS USING :
INTERVAL ANALYSIS :

This decision is in response to applicant's "Renewed Petition Under 37 CFR 1.497(d)" filed 30 March 2006 in the United States Patent and Trademark Office (USPTO).

BACKGROUND

On 02 February 2006, applicant was mailed a decision dismissing applicant's request under 37 CFR 1.497(d) to delete Mr. David R. Schmidt as an inventor in the present application. Applicant was afforded two months to respond and advised that this period could be extended pursuant to 37 CFR 1.136(a).

On 30 March 2006, applicant filed the present renewed petition.

DISCUSSION

As discussed in the decision mailed 02 February 2006, 37 CFR 1.497(d) [formally, 37 CFR 1.48] states in part: "If the oath or declaration filed pursuant to 35 U.S.C. 371(c)(4) and this section names an inventive entity different from the inventive entity set forth in the international application....applicant must submit:

(1) a petition including a statement from each person being added or deleted as an inventor that the error in inventorship occurred without any deceptive intention on his or her part;

(2) an oath or declaration by the actual inventor(s) as required by 37 CFR 1.63;

(3) the fee set forth in 37 CFR 1.17(i); and

(4) if an assignment has been executed by any of the original named inventors, the written consent of the assignee in compliance with 37 CFR 3.73(b).

Applicant previously satisfied items (2) and (3); while item (4) did not apply.

As to item (1), applicant has now submitted a statement from Mr. Schmidt avowing that the error in inventorship occurred without any deceptive intention on his part.

As such, it is proper to grant applicant's renewed request at this time.

CONCLUSION

For the reasons above, applicant's renewed request under 37 CFR 1.497(d) is **GRANTED**.

This application will be given an international application filing date of 17 November 2003 and a date of **27 April 2005** under 35 U.S.C. 371(c)(1), (c)(2) and (c)(4).

This application is being returned to the DO/EO/US for processing in accordance with this decision.

Derek A. Putonen
Attorney Advisor
Office of PCT Legal Administration
Tel: 571-272-3294
Fax: 571-273-0459

ATTACHMENT D

IN THE DRAWINGS

Herewith as ATTACHMENT A please find "Annotated Marked-up Drawings," consistent with 37 CFR §1.121(d)(1) and labeled as such, showing proposed changes to the figures, more particularly:

- **a single revised sheet, 7/20, including FIG. 7C, as originally filed, in addition to FIGS. 7(a) and 7(b); and,**

- **a single revised sheet, 2/20, including FIG. 2, reflecting the substitution of reference numeral 51 for 50.**

>Page 29, line 2, insert after "system" --, that is to say, a geometric function--, so as to now read as follows:

The solver, more particularly the most preferred components thereof, namely SCREEN, PIXEL, COVERAGE, DEPTH, and IMPORTANCE, are shown in relation to the input (i.e., dim and system, that is to say, a geometric function), callbacks (i.e., shader), and output (i.e., pixel data and display). The interrelationships between the individual most preferred elements of constituents of the solver, and the general temporal hierarchy between and among each, as well as their relationships between the callbacks (i.e., the shader) and the output (i.e., the display) are schematically shown in FIG. 12. As will be subsequently discussed in the flow schematics for each of the solvers, and as is appreciated by a reference to the subject figure, hierarchical, iterative sieving progresses, in nested fashion, from the screen solver to the importance solver, with each solver exporting a constraint for which the subsequent solver is to act in consideration thereof. Values from successively embedded solvers are returned as shown, the pixel solver ultimately bundling qualities or character of color, opacity, depth, and coverage, for instance, and "issues" such bundled information package (i.e., a pixel reflecting that scene object subtending same) to the display as shown in furtherance of synthesizing the 2-D array corresponding to the image plane.

➢Page 30, line 7 please replace "Chopping" with --Referring now to FIG. 14, chopping--, so as to now read as follows:

~~Chopping~~ Referring now to FIG. 14, chopping of the x-y image plane begins with an initial step analogous to that illustrated in FIG. 19(b). The idea is to parse the x-y image plane to dimensional equate to a pixel. As shown, in the event that initial chopping yields a sub divided x-y area more extensive than a pixel, more chopping is conducted, namely a preferential chopping. More particularly, the nature of the x-y image plane subunit (i.e., a rectangle) is assessed and characterized as being either "landscape" or "portrait". In the event the subunit is landscape, the x dimension is further split: in the event that the subunit is portrait, then the y dimension is then split. For each iterative step in x or y (see FIGS. 19(b) et seq., the arguments t, u, and v, are contracted so as to eliminate values thereof outside the specific or "working" x-y interval (i.e., with each iteration in x and y, it is advantageous to eliminate the t, u, and v values that are not contributing, and thereby potentially contribute to aliasing).

➢Page 32 line 19 replace "its" with --it--, so as to now read as follows:.

The depth solver, as detailed in FIG. 17, is essentially doing the job of FIG. 17(a). More particularly, DEPTH initially ascertains where in the z dimension, ultimately from the image plane (see FIG.

ATTACHMENT E

VISIBLE SURFACE DETERMINATION SYSTEM & METHODOLOGY IN COMPUTER GRAPHICS USING INTERVAL ANALYSIS

This is a regular application filed under 35 U.S.C. §111(a) claiming priority under 35 U.S.C. §119(e)(1), of provisional application Serial No. 60/426,763, having a filing date of November 15, 2002.

TECHNICAL FIELD

The present invention generally relates to computer imaging or graphics, more particularly, to the field of photorealistic image synthesis utilizing interval-based techniques for integrating digital scene information in furtherance of constructing and/or reconstructing an image of the digital scene, and/or the construction of an image based solely on mathematical formulae.

BACKGROUND OF THE INVENTION

Photorealism for computer-generated scenes, that is to say, the production of a computer-generated scene that is indistinguishable from a photograph of the actual scene, as for instance, the elimination of aliasing, remains the "holy grail" for computer graphic artisans. So much so that Jim Blinn has proclaimed: "*Nobody will ever solve the antialiasing problem,*" emphasis original, Jim Blinn, Jim Blinn's Corner Notation, Notation, Notation, 2003, p. 166. In furtherance of a general appreciation and understanding the single most important obstacle to photorealism, i.e., the antialiasing problem, an overview of heretofore known image synthesizing

ATTACHMENT F

➢**Page 13**, delete the first full ¶ thereon beginning "FIG. 20..." as follows:

~~FIG. 20 is a depiction of importance filtering in the context of the importance function of FIG. 10.~~

➢**Page 14**, in the first partial ¶:

at line 20 thereof, please insert reference numeral --42-- after "database"; and,

at line 24 thereof, please delete reference numerals "32" and "30", as follows:

This grid technique is the real world analogy to the computer graphic process that forms the basis of modern day digital graphics. FIG. 2 shows the overall process of how a computer graphics system 40 turns a three dimensional digital representation of a scene 42 into multiple two-dimensional digital images 44. Just as the artist uses the cells 24 and 32 (FIG. 1) to divide the representation of an entire scene into several smaller and more manageable components, the digital graphics system 40 divides an image 44 to be displayed into thousands of pixels in order to digitally display two-dimensional representations of three dimensional scenes. A typical computer generated image used by the modern motion picture industry, for example, is formed of a rectangular array of pixels 1,920 wide and 1,080 high. In a conventional digital animation process, for example, a modeler defines geometric models for each of a series of objects in a scene. A graphic artist adds light, color and texture features to

plurality of interval consistency solvers. Operatively and essentially linked to the interval consistency solvers is a system input, exemplified in FIG. 10 by a series of generic parametric equations, each function having two or more variables, for example the arguments t, u, and v as shown, and as representatively illustrated in FIG. 11, wherein the "system" is a sphere, the x-y-z functions being parameterized in t, u, v. It is to be understood that the system need not be limited to parametric expressions, which have the greatest utility and are most challenging/problematic, other geometric primitives, or alternate system expressions are similarly contemplated and amenable to the subject methodology and process as is to be gleaned from the discussion to this point. For example, the system can similarly render strictly mathematical formulae selectively input by a user, such as those describing polygons, and bezier surfaces, the later being the singular focus of RenderMan.

➢**Page 29**, in first partial ¶ thereon, at line 8 thereof, please replace "FIG. 12" with --FIG. 13-- as follows:

The solver, more particularly the most preferred components thereof, namely SCREEN, PIXEL, COVERAGE, DEPTH, and IMPORTANCE, are shown in relation to the input (i.e., dim and system), callbacks (i.e., shader), and output (i.e., pixel data and display). The interrelationships between the individual most preferred elements of constituents of the solver, and the general temporal hierarchy